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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/626,738	07/26/2000	Takehiko Nakai	35.C14646	9374

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EXAMINER

AMARI, ALESSANDRO V

ART UNIT PAPER NUMBER

2872

DATE MAILED: 03/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/626,738

Applicant(s)

NAKAI, TAKEHIKO

Examiner

Alessandro V. Amari

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7 and 9-17 is/are rejected.
- 7) ☒ Claim(s) 8 and 18 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 7, 9-12 and 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Cohen U.S. Patent 4,210,391.

In regard to claim 7, Cohen discloses (see Figure 4) a diffraction optical element in which a plurality of diffraction gratings are laminated, comprising a first diffraction grating which is formed on a curved surface (see grating on right side of Figure 4) with a material of a predetermined dispersion as described in column 5, lines 39-46, wherein an imaginary surface including tips of grating portions of said first diffraction grating is a curved surface (see attachment A – Examiner marking of Figure 4 showing curved imaginary surface); and a second diffraction grating (see grating on right side of Figure 4) which is formed on a curved surface with a material of a dispersion different from that of said first diffraction grating as described in column 5, lines 39-46 and adjacent to said first diffraction grating, wherein an imaginary surface including tips of grating portions of said second diffraction grating is a curved surface (see attachment A – Examiner marking of Figure 4 showing curved imaginary surface), wherein the pitches of corresponding grating portions of said first and second diffraction gratings are equal over the range of use as shown in Figure 4 and as described in column 5, lines 36-50.

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Regarding claim 9, Cohen discloses that at least one of said laminated diffraction gratings has at least one diffraction grating differing from it in the direction of the grating shape of the grating portion as shown in Figure 4.

Regarding claim 10, Cohen discloses that the wavelength area used is a visible range as described in column 3, lines 44-53 and column 7, lines 45-47.

Regarding claim 11, Cohen discloses that at least one of said plurality of diffraction gratings is such that the material (CL) forming said diffraction gratings is the same as the material forming a substrate on which said diffraction gratings are provided as described in column 5, lines 36-46.

Regarding claim 12, Cohen discloses that said substrate has lens action as described in column 5, lines 36-46 and column 7, lines 27-28.

Regarding claim 14, Cohen discloses that said plurality of diffraction gratings are laminated so that the diffraction efficiency of a particular order may heighten in the entire wavelength area used as described in column 3, lines 14-16, 67-68, column 4, lines 1-2.

Regarding claim 15, Cohen discloses an optical system using a diffraction optical element as described in column 1, lines 8-12 and column 3, lines 1-2 and column 7, lines 45-47.

Regarding claim 16, Cohen discloses an optical system which is an imaging optical system as described in column 1, lines 8-12 and column 3, lines 1-2 and column 7, lines 45-47.

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Regarding claim 17, Cohen discloses an optical system which is an observation optical system as described in column 1, lines 8-12 and column 3, lines 1-2 and column 7, lines 45-47.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cohen U.S. Patent 4,210,391 in view of Ogino et al. U.S. Patent 5,995,279.

Regarding claim 13, Cohen teaches the invention as set forth above but does not teach the diffraction optical element formed on a cemented surface of a cemented lens.

Ogino et al. does teach the diffraction optical element formed on the cemented surface of a cemented lens as shown in Figures 5A-5F and as described in column 3, lines 3-33. It would have been obvious to one having ordinary skill in the art at the time the invention was made to form the diffraction grating of Cohen on the cemented surface of a cemented lens as taught by Ogino et al. in order to compensate for chromatic aberrations which might exist in other associated optical elements.

Allowable Subject Matter

5. Claims 8 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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6. Claim 8 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "said diffraction gratings are formed are joined together in the non-grating area of each of said diffraction gratings" as set forth in the claimed combination.

Claim 18 is allowable over the prior art for at least the reason that the prior art fails to teach or reasonably suggest, "the first and second diffraction gratings are disposed via an air layer" as set forth in the claimed combination.

The prior art of record, Cohen and Ogino et al teach a diffraction optical element in which a plurality of diffraction gratings are laminated, comprising a first diffraction grating which is formed on a curved surface with a material of a predetermined dispersion, wherein an imaginary surface including tips of grating portions of said first diffraction grating is a curved surface; and a second diffraction grating which is formed on a curved surface with a material of a dispersion different from that of said first diffraction grating and adjacent to said first diffraction grating, wherein an imaginary surface including tips of grating portions of said second diffraction grating is a curved surface, wherein the pitches of corresponding grating portions of said first and second diffraction gratings are equal over the range of use. However, the prior art does not teach that said diffraction gratings are formed are joined together in the non-grating area of each of said diffraction gratings or that the first and second diffraction gratings are disposed via an air layer and no motivation or teaching is present to modify this difference as derived.

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Response to Arguments

7. Applicant's arguments with respect to claims 7-18 have been considered but are moot in view of the new ground(s) of rejection.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (703) 306-0533. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cassandra Spyrou can be reached on (703) 308-1687. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

ava
March 4, 2003


MARK A. ROBINSON
PRIMARY EXAMINER